current passes, if rendered quite pure, scarcely suffers change, because it then becomes a very bad conductor.

412. If it should hereafter be proved that the want of decomposition in those cases where, from chemical considerations, it might be so strongly expected (404, 407, 409), is due to the absence or deficiency of conducting power, it would also at the same time be proved that decomposition *depends* upon conduction, and not the latter upon the former (149); and in water this seems to be very nearly decided. On the other hand, the conclusion is almost irresistible, that in electrolytes the power of transmitting the electricity across the substance is *dependent* upon their capability of suffering decomposition; taking place only whilst they are decomposing, and being proportionate to the quantity of elements separated (556). I may not, however, stop to discuss this point experimentally at present.

413. When a compound contains such elements as are known to pass towards the opposite extremities of the voltaic pile, still the proportions in which they are present appear to be intimately connected with capability in the compound of suffering or resisting decomposition. Thus, the protochloride of tin readily conducts, and is decomposed (138), but the perchloride neither conducts nor is decomposed (142). The protiodide of tin is decomposed when fluid (138); the periodide is not (143). The periodide of mercury when fused is not decomposed (426), even though it does conduct. I was unable to contrast it with the protiodide, the latter being converted into mercury and periodide by heat.

414. These important differences induced me to look more closely to certain binary compounds, with a view of ascertaining whether a *law* regulating the *decomposability* according to some *relation of the proportionals or equivalents* of the elements, could be discovered. The proto compounds only, amongst those just referred to, were decomposable; and on referring to the substances quoted to illustrate the force and generality of the law of conduction and decomposition which I discovered (138), it will be found that all the oxides, chlorides, and iodides subject to it, except the chloride of antimony and the periodide of

mercury (to which may now perhaps be added corrosive sublimate), are also decomposable, whilst many per compounds of the same elements, not subject to the law, were not so (141, 142).

415. The substances which appeared to form the strongest exceptions to this general result were such bodies as the sulphuric, phosphoric, nitric, arsenic, and other acids.